1.3 LAB EXERCISE

Part A – Relative Time

Relative time is an important tool for geologist to quickly construct series of events, especially in the field. In the following section, apply what you have learned regarding relative time to the questions below.

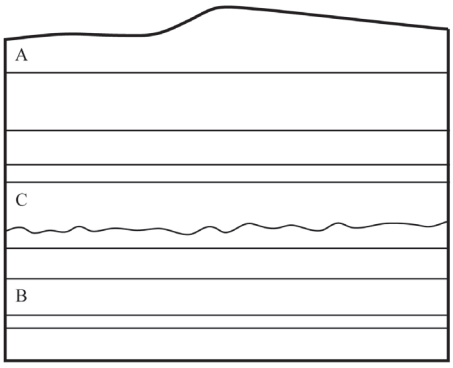

Figure 1.8 | Block diagram to use to answer questions 1 and 2.
Author: Bradley Deline
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1. In Figure 1.8, which of the following rock layers is the **oldest**?

   a. A b. B c. C

2. Which Geologic Law did you use to come to the conclusion you made in the previous question?

   a. The Law of Superposition b. The Law of Cross-Cutting

   c. The Law of Original Horizontality d. Unconformities

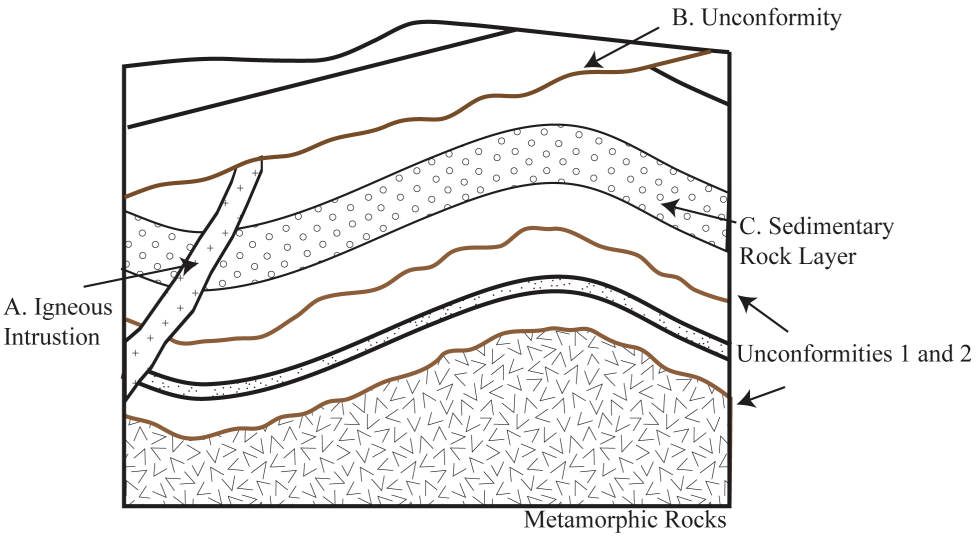

Figure 1.9 | Block diagram to use to answer questions 3, 4, and 5. Unconformities are shown in brown.
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3. In Figure 1.9, which of the following geologic structures is the **youngest**?

   a. A b. B c. C

4. Which Geologic Law did you use to come to the conclusion you made in the previous question?

   a. The Law of Superposition
   b. The Law of Cross-Cutting
   c. The Law of Original Horizontality
   d. Unconformities

5. Examine unconformities 1 and 2 indicated in Figure 1.9. Which of the following statements about them is true?

   a. The older unconformity is a Nonconformity, while the younger is an Angular Unconformity.

   b. The older unconformity is a Disconformity, while the younger is a Nonconformity.

   c. The older unconformity is a Nonconformity, while the younger is a Disconformity.

   d. The older unconformity is an Angular Unconformity, while the younger is a Disconformity.

6. Examine the Unconformity shown in Figure 1.10. What type of unconformity is this?

   a. Angular Unconformity

   b. Nonconformity

   c. Disconformity

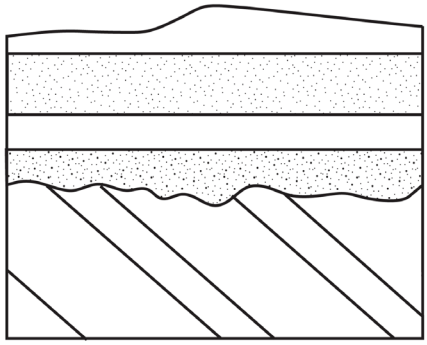

Figure 1.10 | Block diagram to use to answer question 6.
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Examine Figure 1.11. Note that all of the layers in this block diagram are composed of sedimentary rock and the unconformities are colored in red. Using the geologic laws discussed earlier and following the examples shown in Figures 1.6 and 1.7, identify the geologic events that occurred in this area. Then place the following geologic events in the correct relative time sequence.

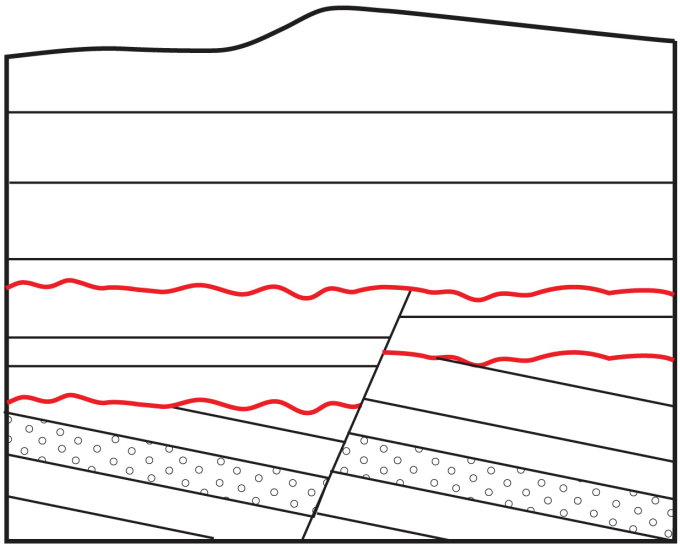

Figure 1.11 | Block diagram to use to answer questions 7, 8, and 9. Unconformities are shown in red.
Author: Bradley Deline
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a. Tilting.

b. Uplift and Erosion (Angular Unconformity).

c. Submergence and deposition of sedimentary layers 10-13.

d. Uplift and Erosion to current position.

e. Submergence and Deposition of sedimentary layers 7-9.

f. Uplift and Erosion (Disconformity)

g. Submergence and deposition of sedimentary layers 1-6.

h. Fault.

1	2	3	4	5	6	7	8
Oldest							Youngest

7. Which of the above geologic events is the second in the sequence?

a. A b. B c. C d. D

e. E f. F g. G h. H

8. Which of the above geologic events is the fifth in the sequence?

a. A b. B c. C d. D

e. E f. F g. G h. H

9. Which of the above geologic events is the seventh in the sequence?

a. A b. B c. C d. D

e. E f. F g. G h. H

1.4 FAUNAL SUCCESSION AND INDEX FOSSILS

Another useful tool in relative dating are fossils. Fossils are the preserved remains of ancient organisms normally found within sedimentary rocks. Organisms appear at varying times in geologic history and go extinct at different times. These organisms also change in appearance through time. This pattern of the appearance, change, and extinction of thousands of fossil organisms creates a recognizable pattern of organisms preserved through geologic time. Therefore, rocks of the same age likely contain similar fossils and we can use these fossils to date sedimentary rocks. This concept is called the **Law of Faunal Succession**.

Some fossils are particularly useful in telling time, these are called **Index Fossils**. These are organisms that we are likely to find because they were abundant when they were alive and were likely to become fossils (for example, having a robust skeleton). These organisms often have a large geographic range so they can be used as an index fossil in many different areas. However, they should also have a short geologic range (the amount of time an organism is alive on Earth), so we can be more precise in the age of the rock if we find the fossil. Index fossils are often the quickest and easiest way to date sedimentary rocks precisely and accurately.